

## CHARACTERIZATION OF OCEAN USES

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### Summary

Massachusetts coastal waters accommodate a wide variety of uses that are often separated by time of day, seasons of the year, location (i.e., sea floor bottom, water column, water surface, air), or existing “zones” to accommodate specific use areas (e.g., shipping lanes). Given the high use levels in our waters, actual use conflicts in Massachusetts are relatively limited. However, an increase in overall level of use, the development of new types of coastal and ocean activities, and a loss of productive maritime and estuarine habitat will likely lead to a significant increase in user conflicts.

Information on historical and up-to-date inventories of the uses and resources of the state’s marine waters has not always been readily available, and should be, in order to support ocean management planning and to identify trends in human maritime activities. These inventories should be GIS-based and:

- illustrate uses and resources on the seafloor, in the water column, at or above the ocean surface, and in the air space above the ocean;
- indicate when human and natural activities and events occur over time; and
- incorporate relevant upstream and offshore areas that affect coastal resources.

Successful management of human activities in the near-shore environment must be based on a sound knowledge of those activities and the sustainability of the resources they impact. For this reason, information on natural resources and human activities should be developed in a format that allows for easy overlays and comparison of information.

### Background

As part of the Ocean Management Task Force’s efforts, the Use Characterization Working Group (UCWG) was created to help:

- 1) examine human uses and activities in Massachusetts coastal waters;
- 2) identify areas of multiple uses, as well as those of highest user conflict;
- 3) develop narrative descriptions and visual representations that summarize these uses; and
- 4) identify potential coastal and ocean use trends.

The UCWG relied for the most part on existing data. Many data sets for water quality conditions, natural resource characteristics, political and regulatory jurisdictions, and stationary structures are already available through the Massachusetts Ocean Resource Information System (MORIS), and other GIS-based programs. MORIS is a comprehensive database providing access to the broad range of information necessary to manage coastal and ocean resources. An ArcView-based application provides easy access to the MORIS dataset, which currently houses over 200 layers. This application and the MORIS datasets are currently distributed free on CD-ROM, but will be available for download and display on the MassGIS on-line mapping site in late 2004, making it highly accessible to the general public.

The UCWG developed preliminary use characterizations and narratives based on these data to help guide the OMTF in drafting preliminary recommendations. The initial efforts, using static drawings that depicted various uses of coastal waters in different regions of the state, were helpful in providing the Task Force with very general use characterizations, but lacked specificity with regard to location of uses, seasonality of activities, and cross-sectional uses that may extend from the sea floor to the air space above the ocean surface. Problems were also identified in graphically representing widespread uses, such as recreational boating and lobster fishing, where a GIS-based application or narrative description would provide more clarity. From this effort, it became clear that there was a need to collect, inventory, house, update, and manage information on uses and activities in coastal waters, and develop accessible methods to display and interpret complex use characterizations to ocean managers and the general public. Based on feedback from the OMTF and the public, rough-cut coastal and ocean use characterizations have been useful to the OMTF to get a sense of what's going on where, but the real value of use characterizations is as a long-term management and educational tool for resource managers and the public. Accordingly, the OMTF has adopted a recommendation that the Commonwealth develop comprehensive, GIS-based use characterizations that will be updated on a regular basis.

The UCWG sought to identify human use trends and developed its own list of trends, which was supplemented by additional public comments. However, the UCWG received several recommendations to develop historical use characterizations, which could then be used to identify trends in a more empirical fashion rather than rely on time-specific observations and anecdotal information. Developing historical use characterizations are part of the Use Characterization Recommendation in Management Tools and are included to assist in the identification of human use trends over time for decision-makers and the public.

The UCWG's initial use characterization, describing the types of activities and general physical characteristics in each of five Massachusetts coastal regions, appears in this chapter. The Use Characterization Recommendation in Management Tools outlines the steps needed to more fully develop use characterizations and present relevant information in a clear, accessible format for use by ocean managers and the public.

The UCWG was chaired by Tom Skinner and staffed by Deerin Babb-Brott. Other UCWG members included Bill Adler, Dale Brown, Tom Cox, Rip Cunningham, Robbin Peach, Tim Smith, and Tim Timmermann. Vin Malkoski, Tony Wilbur, Steve Mague, Diane Carle, Todd Callaghan, Andrea Cooper, Jason Burtner, Truman Henson, and Dave Janik participated from state environmental agencies.

### **Methodology for Developing Characterizations of Uses in Different Regions of the State's Oceans**

There is currently no comprehensive database identifying the type, spatial and temporal qualities, and geographic locations of the myriad activities that take place along the Massachusetts coast. To assist the Task Force in the development of its draft preliminary

recommendations, the UCWG developed a rough geographic representation of coastal and ocean uses, based on personal knowledge of staff from the Massachusetts DMF and the Massachusetts Office of CZM. Given the significant limitations of the static geographic representations, a narrative was developed in which the natural, industrial, recreational, commercial, and other characteristics or uses were generally described for each of five coastal regions.

Although the narrative and the geographic representations are included in this chapter, it is important to understand that both products were developed specifically as illustrative representations to provide the Task Force with a working sense of the uses and resources that characterize the several geographic regions within Massachusetts state waters. They were presented to the Task Force to generally describe and illustrate the industrial, commercial, recreational, natural, and other (*e.g.*, military/homeland security and cultural) coastal features.

Initially, the UCWG had to determine the scope of its work and whether land, harbor or shoreline-based uses or resources within each of the categories should be included, and, if so, how they should be represented. For example, individual marine-related facilities within a harbor, upland areas within a coastal watershed that contribute significant non-point runoff, local shellfish beds, and inshore areas frequented by recreational fishers were all considered for inclusion in the use characterization.

The determining issue in these deliberations was the Task Force's purpose to recommend an overall ocean management strategy, and not to develop actual information-based management plans – at least at this point in time. In this regard, the UCWG imposed basic assumptions on our product and recommendations to help focus on uses and resources of the ocean proper, resulting in the following general approach:

- The maps focus on the major features that directly occupy or have a major effect on the ocean, as opposed to harbors and small embayments.
- Specifics on the most common or predominant coastal features are not included because most of these features are located at the terrestrial margin. Rather, the information forms the basis for the textual characterization of the regions. Terrestrial features are mapped where they are highly determinative of the use or character of the region, like the Great Marsh on the North Shore, or the National Seashore on Cape Cod.
- Industrial, commercial and recreational uses of ports and harbors are illustrated, with greater emphasis indicated for areas of intense use; note that some level of recreational and commercial boating use is associated with every harbor and inlet coast-wide.
- With the notable exception of the lobster fishery, which tends to occur almost everywhere along the Massachusetts coast, the information on fisheries is presented not to illustrate for planning purposes what is fished for where, but as an illustration of the fact that, while fishing may be said to occur “everywhere,” there are generally identifiable areas of higher recreational and commercial effort, based on bathymetry, surficial geology/habitat, or the seasonal presence of a

given species. We have illustrated some of that in these characterizations. For future management plans, information from recreational and commercial fishing sources can be overlaid to compile a detailed use characterization.

Once our assumptions have been applied, there are not a lot of human constructions to map. The primary uses of our ocean waters include industrial intake and discharge of seawater, cables and pipelines, industrial vessel navigation (in narrowly geographically defined areas), recreational and commercial boating and fishing (over broad and geographically diverse areas) and intertidal/shallow water shellfish aquaculture.

### **Regional Use Characterizations**

The initial use characterization developed for the Task Force included both a narrative and graphic, static representations of existing uses along the Massachusetts coast. Some uses, such as shipping channels and industrial port facilities, were clearly shown on the graphic representations, which used NOAA charts for base-line information. Other types of information, such as ports for commercial or charter-boat fishing, or areas of higher-than-normal recreational boating activity, were easier to describe in the narrative section. In this report, we have included one coast-wide use characterization graphic representation, the narrative description, and an example of a MORIS natural features map, illustrating how use characterization information could be displayed in a GIS-based format.

### **NORTH SHORE (SALISBURY TO NAHANT)**

#### **North Shore: Summary**

The North Shore features major commercial and recreational boating and fishing uses, including a growing ecotourism industry. There are two ports with significant industrial features. Generally, the coastline is open to the ocean and marine uses are concentrated in near-shore waters. From Cape Ann to the south, the seafloor is characterized by major areas of hard bottom and relief with a major lobster fishery; north of Cape Ann the seafloor is predominantly sand and flat bottom sloping up to a significant barrier beach/saltmarsh system. The Annisquam River is a major ocean use feature for commercial and recreational boats.

#### **North Shore: Natural Resource Characteristics**

North of Cape Ann is generally a sand and flat bottom coast with a significant barrier beach/saltmarsh system, which serves as a stopover on the Atlantic Flyway for migratory birds. South of Cape Ann is characterized by hard bottom and relief. The Great Marsh across the Essex Bay and Plum Island Sound regions comprises over 25,000 acres of beach/marsh habitat and defines the regional coastal character; it is designated by the state as an Area of Critical Environmental Concern (ACEC). The Merrimack River is a major run for diadromous fish and contains populations of endangered fish species.

Jeffries Ledge is a major geographic feature targeted by commercial and recreational fishers and boaters. Whales and other marine mammals frequent North Shore waters. The water quality is good outside of harbors and embayments, but enclosed and/or populated areas typically experience some impairment of water quality in the immediate vicinity of sewage outfalls and, more broadly following periods of significant rain, leading to temporary closures of shellfish beds.

### **North Shore: Industrial Characteristics**

In general, only Gloucester and Salem are hubs of industrial activity in the North Shore area of the state's oceans. Each port has industrial shipping activity supported by major federal navigation channels. There is a transitway offshore and parallel to the coast for ships crossing the Gulf of Maine. Outfalls are located along the coast (Newburyport, Ipswich, Rockport, Gloucester, Manchester, Salem, and Swampscott). Salisbury to Gloucester is characterized by a lack of industrial features other than outfalls. The Merrimack River carries industrial effluent, including treated sewage and industrial process water.

### **North Shore: Commercial Characteristics**

Commercial fishing (all kinds, including charters, party boats, etc.) and boating (whale watching, kayak tours) is practiced extensively in the nearshore waters. The Merrimack River, Cape Ann, and Salem Sound areas are homeport to significant commercial fleets. Commercial vessels use the Annisquam River heavily. Essex Bay and Plum Island Sound are areas of significant commercial use by ecotourism businesses. While lobster potting occurs in virtually all near-shore waters, it is generally concentrated within the 120-foot depth line. Roughly 13% of the total state lobster catch occurs in the waters between Nahant and Manchester and 15% of the total between Gloucester and Rockport, the two most productively fished areas. Dragging, gillnetting and lobster potting occur from Eastern Point south through Massachusetts Bay; dragging and scallop dredging occur in Ipswich Bay.

### **North Shore: Recreational Characteristics**

Recreational boating occurs throughout the North Shore waters, and every harbor and port supports some level of boating activity. The Merrimack River, Plum Island Sound, Essex Bay, Cape Ann, and Salem Sound are major hubs of recreational activity. The Annisquam River/Blynman Canal is a major recreational feature that connects Ipswich Bay and Massachusetts Bay. Recreational boating destinations include nearshore fishing locations, all of Cape Ann for diving, and Stellwagen Bank. The Great Marsh across the Essex Bay and Plum Island Sound regions is a major recreational destination. North of Cape Ann is characterized by public beaches of regional and national significance.

### **North Shore: Military, Cultural, & Other Characteristics**

The Coast Guard has stations in Newburyport and Gloucester. There are U.S. Navy submarine routes off the North Shore up to Portsmouth, NH, and the Gulf of Maine area.

### **MASSACHUSETTS BAY (METRO BOSTON AREA; NAHANT TO COHASSET)**

#### **Massachusetts Bay: Summary**

A key feature of Massachusetts Bay is its breadth and the great diversity of uses over, on, and beneath the waters. Boston is the regional maritime industrial and commercial hub, and the uses centered around the port dominate the waters. Planes using Logan Airport approach and depart over Massachusetts Bay and sewage from metropolitan Boston communities is treated at Deer Island and pumped through a tunnel nine miles offshore. Major shipping lanes and anchorages and a dredged material disposal site in federal waters support major commercial and industrial vessel traffic. The Boston Harbor Islands are a nearshore natural and recreational area, and the Stellwagen Bank National Marine Sanctuary is a major offshore natural, recreational, and commercial area. Nearshore waters offer major opportunities for recreational diving and support the state's greatest concentration of lobster potting; offshore waters support dragging, gillnetting, charter and party boat fishing, and recreational fishing. Whales and other marine mammals frequent Massachusetts Bay waters. Massachusetts Bay is defined by a baseline of the territorial sea, drawn from Eastern Point in Gloucester to Strawberry Point in Cohasset; state waters extend three miles seaward of the baseline. Under this delineation, a significant portion of the Bay lies outside municipal boundaries but within state waters.

#### **Massachusetts Bay: Natural Resource Characteristics**

Massachusetts Bay has diverse surficial geology. The nearshore waters of Massachusetts Bay are characterized by hard bottom and relief, including islands and submerged and intertidal ledges. Areas of gravel and cobble have been identified as significant habitat for juvenile lobster. To the north, Broad Sound, enclosed by the rocky headlands of Nahant and Winthrop, is a generally sandy embayment that slopes up to a major beach area backed by an extensive saltmarsh system designated by the state as an ACEC. To the south, the sand and cobble beaches and nearshore waters off Hull give way to the bold shore and rocky bottom of Cohasset. The offshore seafloor is a mix of hard bottom (sand/gravel/cobble/boulder/ledge) out to the soft bottom areas from south of Cape Ann, through Stellwagen Basin, down into Cape Cod Bay. Stellwagen Bank, a National Marine Sanctuary, is a major offshore natural feature of local, regional, and national significance. Several species of whales and other marine mammals frequent Massachusetts Bay waters, including, notably, endangered Humpback and Northern Right Whales; Stellwagen and bordering waters are major feeding grounds. The new Massachusetts Water Resources Authority (MWRA) treatment plant has significantly improved nearshore water quality; monitoring of Massachusetts Bay water quality does not appear to show significant adverse impacts; the potential for chronic impacts continue to be studied.

### **Massachusetts Bay: Industrial Characteristics**

Boston Harbor is a major maritime industrial port. Shipping is a major use of Massachusetts Bay waters; the major shipping lanes run from Boston outer harbor to the southeast off of Provincetown. Ships carrying products such as petroleum products, liquefied natural gas, automobiles, scrap metal, other manufactured goods, and cruise passengers pass in and out of Boston daily. Several power plants, manufacturers (Gillette, for example), and businesses (Hook Lobster Co., for example) use seawater from the harbor. The Conley container terminal, the complex of uses on the Mystic River, Logan Airport, and Chelsea Creek are major industrial features. The Fore River Shipyard (whose use is discontinued) in Quincy and Weymouth Back River (gas pipeline and ships carrying petroleum products) are areas of localized industrial activity. The MWRA outfall discharges treated municipal sewage from the metro-Boston area nine miles out into Massachusetts Bay. Lynn and Hull have municipal outfalls. The Saugus River supports the General Electric jet engine plant and the Refuse Energy Systems Company (RESCO) trash to energy facility, both of which draw water from and discharge back into the river. A tidal power desalinization plant has been proposed off Hull. Massachusetts Bay waters were used historically for dumping industrial waste, including low-level radioactive waste, and dredged material. The Massachusetts Bay Disposal Site, a federally designated disposal site for dredged material, is located just outside state waters on the edge of the Stellwagen sanctuary; historic dumping grounds are noted on NOAA charts and include two prominent areas, the Boston Lightship site and the Industrial Waste Site (IWS).

### **Massachusetts Bay: Commercial Characteristics**

Massachusetts Bay also supports a major concentration of commercial uses; while most of Massachusetts Bay supports some level of commercial activity, the intensity of use is greatest from the waters around the Boston Harbor Islands landward. Fishing of all types, dive charters, and passenger ferries frequent these nearshore waters. Offshore, Stellwagen and neighboring waters support whale watching and charter and party boats. There are major recreational marinas in Lynn, Revere, Boston, Quincy, Weymouth, Hingham and Hull. A gambling boat departs from Lynn. Major commercial routes crisscross the Bay connecting the Cape Cod Canal, Boston Harbor, the Annisquam River, and Provincetown/Stellwagen Bank. Massachusetts Bay is heavily used for commercial fishing, and supports a major lobster fishery (28% of the state's total catch), groundfish dragging, gillnetting, and charter and party boats. Generally, dragging occurs where the bottom is flat and open; other gear is used on areas of greater relief.

### **Massachusetts Bay: Recreational Characteristics**

Massachusetts Bay is a major recreational area and boating occurs throughout the waters. Major destinations include Stellwagen Bank for fishing and whale watching, and the Harbor Islands for boating, hiking, fishing, and diving. Recreational fishing and diving occur at numerous nearshore areas. Major recreational routes connect the Cape Cod

Canal, Boston Harbor, the Annisquam River, Provincetown/Stellwagen Bank, and smaller ports in between.

### **Massachusetts Bay: Military, Cultural, & Other Characteristics**

The U.S. Coast Guard has stations in Hull and Boston. Military vessels from the U.S. Navy and other countries visit Boston occasionally; some repair/service facilities for military vessels are available.

### **SOUTH SHORE AND CAPE COD BAY (SCITUATE TO PROVINCETOWN)**

#### **South Shore and Cape Cod Bay: Summary**

Compared to Massachusetts Bay, Cape Cod Bay has a lower but still significant intensity of uses. Primary features include its largely sand and cobble composition and shallow waters; the Cape Cod Canal, which is a major industrial, commercial and recreational feature; and the harbors of Marshfield, Scituate, Duxbury, Plymouth, Barnstable, Wellfleet, and Provincetown, which support substantial recreational and commercial fleets. Recreational use is high. Much of Cape Cod Bay is a seasonal feeding ground for the endangered Northern Right Whale. Industrial use is relatively low, and includes shipping, municipal sewage outfalls, and two power plants.

#### **South Shore and Cape Cod Bay: Natural Characteristics**

The South Shore coastline from Scituate to Plymouth is predominantly sand and cobble beaches, the product of the region's geology and exposure to seas from the east and northeast, which typically experience significant coastal erosion during storm events. Nearshore gravel and cobble beds support juvenile lobster. Cape Cod Bay itself is more protected and less dynamic; it is a relatively shallow, flat embayment characterized by sandy/silty sediments, sandier to the northwest and siltier to the southeast. Billingsgate Shoal, off Wellfleet, is the major submarine feature and forage ground for gamefish. (The great white shark in the Smithsonian was caught on Billingsgate.) Cape Cod Bay is designated critical habitat for the Northern Right Whale, which typically inhabit the waters during winter and early spring months, although individual whales may periodically stay on later in the year. Humpbacks, other species of whales, other marine mammals, and turtles frequent the waters. Mass strandings of lesser whales and turtles is a relatively common occurrence on the eastern coast of the bay. Water moves through Cape Cod Bay in a generally counter-clockwise circular pattern, entering from the north along the west coast of the bay, circulating south, east, and north following the perimeter of the bay, and exiting off Provincetown. The water quality is generally good and locally excellent (*e.g.*, Wellfleet Harbor is designated as a body of Outstanding Resource Water); however, in some areas, rain events flush septage from nearshore leach fields and cause temporary and localized closures of shellfish beds.



### **South Shore and Cape Cod Bay: Industrial Characteristics**

There are relatively few industrial uses on the South Shore and in Cape Cod Bay. Scituate, Marshfield and Plymouth have sewage outfalls. The water-cooled Pilgrim Station nuclear power plant is located in Plymouth and the power plant in Sandwich along the Cape Cod Canal are the only major industrial facilities. The Canal supports small and medium sized industrial ship traffic to and from Boston and points north; tugs and barges carrying petroleum products represent the majority of the industrial traffic, which runs parallel up the western coast of the bay to Boston. Occasional cruise ships call at Provincetown. The Cape Cod Disposal Site, a state-designated site for dredged material, is located in state waters off Wellfleet. Designated in 1994, the site has been used by municipal and private facilities in Duxbury, Plymouth, Wellfleet, and Provincetown. The site is closed from January to mid-May to avoid impacts with Northern Right Whales.

### **South Shore and Cape Cod Bay: Commercial Characteristics**

Commercial boating is a major use of south coast and Cape Cod Bay waters. Lobster potting is a major use – south shore waters account for 18% of state total lobster catch; the open waters of the bay and the southern and eastern nearshore account for another 13%. Groundfish dragging and localized scallop dredging occur in the bay and there is significant fishing for tuna, bluefish, and striped bass. The harbors of Marshfield, Scituate, Duxbury, Plymouth, Barnstable, Wellfleet, and Provincetown support major commercial fleets; Additionally, Rock Harbor in Orleans is home to one of the biggest charter fishing fleets in the northeast. All harbors and inlets support some level of commercial fishing activity. Shellfish aquaculture is a major nearshore (intertidal) commercial use, particularly along the eastern shoreline (*e.g.*, Provincetown and Wellfleet).

### **South Shore and Cape Cod Bay: Recreational Characteristics**

Fishing, diving, and sailing are major uses of South Shore and bay waters. The harbors described above under “Commercial Characteristics” also support major recreational fleets. The beach and nearshore areas along the entire periphery of the region are heavily used for swimming, boating, kayaking, strolling and fishing. Billingsgate Shoal is a major recreational destination. Recreational diving for lobster occurs from Scituate to Barnstable. Off-road vehicle use is heavy in Plymouth and along the outer cape beaches and flats.

### **South Shore and Cape Cod Bay: Military, Cultural, & Other Characteristics**

The U.S. Coast Guard has a station in Provincetown. The U.S. Navy periodically conducts small fleet maneuvers in the waters between the Cape Cod Canal and Massachusetts Bay off Boston Harbor.

**CAPE COD AND THE ISLANDS (EASTERN AND SOUTHERN WATERS OFF CAPE COD, AND ALL WATERS OFF MARTHA'S VINEYARD, NANTUCKET AND THE ELIZABETH ISLANDS)**

**Cape Cod and the Islands: Summary**

The Cape Cod and Islands region is characterized by dynamic sediment systems and locally by high-energy wave formations that impact both the landforms and the near shore bathymetry. These features, in conjunction with the many small harbors, estuaries and barrier beaches, have helped shape the historical and cultural foundation of the region. Fishing, yachting and other waterfront activities, together with the need to provide critical resources and services to the people of Nantucket, Martha's Vineyard, and the Elizabeth Islands have also shaped shorefront development in this region and the uses of the waters surrounding it. Finally, the entire region is largely dependant on tourism and therefore on the accommodation of recreational activities and the environmental conditions necessary for the support of that economy.

**Cape Cod and the Islands: Natural Characteristics**

The coasts of Cape Cod and the Islands are characterized by sandy barrier beaches backed by coastal dunes and coastal banks along much of the coast. There are dozens of coastal embayments and estuarine harbors scattered along the coasts as well. The surrounding waters vary from the very shallow depths of Nantucket Sound and the Nantucket Shoals, to the deeper waters of Cape Cod Bay and Vineyard Sound, to the ocean depths immediately off the eastern shore of Cape Cod. To the east of Cape Cod, the bathymetry quickly reaches to depths of one hundred feet and more, with the area subject to significant unimpeded wave energy, whereas the shallower and more protected waters are much more quiescent by comparison. There are thousands of acres of salt marsh and the area is significant to several endangered species of birds and vegetation. The Cape Cod National Seashore boundary includes portions of six of the outer cape towns, and the Cape is also home to the Mashpee and Monomoy National Wildlife Refuges. State-designated Ocean Sanctuaries encompass most of the state waters surrounding the region.

**Cape Cod and the Islands: Industrial Characteristics**

The industrial uses of the area are primarily related to fuel transport and storage. There are tank facilities located in Vineyard Haven Harbor on Martha's Vineyard and on Nantucket. Fuel is transported by barge to both of these facilities in significant quantities. Cruise ships, generally small coastal packets, call at Martha's Vineyard and Nantucket. There are also industrial transport activities associated with the year-round ferry service to the islands from Hyannis and Woods Hole.

**Cape Cod and the Islands: Commercial Characteristics**

Commercial fishing takes place with varying intensity in many of the harbors across the Cape and the Islands. While many smaller day trip boats dock at harbors such as

Hyannis, Oak Bluffs and Menemsha, the most significant efforts take place from Aunt Lydia's Cove and Stage Harbor in Chatham, and from MacMillan Pier in Provincetown. Fisheries include lobster potting, fish, scallop and quahog dragging and commercial scale tuna and other finfish efforts. Hyannis, Falmouth, Menemsha, Oak Bluffs and Nantucket host large charter fishing fleets. Additionally, whale watching and eco-tourism operations embark from several harbors in the region.

### **Cape Cod and the Islands: Recreational Characteristics**

Recreational boating popularity has exploded throughout the region during the past decade. This has caused significant burden and management challenges for those charged with the oversight of these activities. As evidence of the importance of this pastime, there are over fifty boat yards and other boat service facilities located on the Cape and Islands. Notwithstanding the long history of yachting around the area, it has gained even more popularity with economic growth of the region and is now of a greater magnitude than ever. Two particular concerns associated with this growth are the inherent conflict between this use and the other traditional and current uses of the area, and also the struggle to accommodate these numbers of boats along with their attendant supporting infrastructure, such as moorings, slips, and maintenance facilities.

### **Cape Cod and the Islands: Military, Cultural, & Other Characteristics**

The Massachusetts Military Reservation (MMR) is approximately 23,000 acres in size and is located on Cape Cod within the towns of Sandwich, Mashpee, Falmouth and Bourne on the Upper Cape. This facility is home to units of the Massachusetts Army National Guard, Air Force Reserve and Coast Guard. In addition to its air field and aircraft support facilities, artillery and other weapons training has taken place there for decades. As a result of the various military activities over the years, there are several ground contamination sites located on and around MMR and remediation efforts are underway on many. Nomans Island, off the southwest shore of Martha's Vineyard, was used by the military as a bombing practice site for decades. It is not currently open for public access due to the presence of unexploded ordinance. However, it has been subject to some clean-up efforts and is currently under the management of the U.S. Fish and Wildlife Service.

The region is also home to the Wampanoag Tribes of Mashpee and Aquinnah (Gay Head).

### **SOUTH COASTAL REGION (THE WATERS OF BUZZARDS BAY AND MOUNT HOPE BAY AND 16 COASTAL COMMUNITIES ADJACENT TO THOSE WATERS)**

#### **South Coastal Region: Summary**

The South Coastal region is centered around two coastal embayments, Buzzards Bay and Mount Hope Bay. Mount Hope Bay is a sub-part of the much larger Narragansett Bay

system primarily located within Rhode Island waters. The region's ocean resources have both a wide variety of uses and a high intensity of use. The region includes two of the Commonwealth's largest industrial ports, Fall River and New Bedford. These ports are home to the most valuable fishing port in the United States, extensive power generation facilities, and associated infrastructure, and other significant port uses. Buzzards Bay is a major shipping lane for petroleum and other cargoes that are brought to the Northeast. The region also contains extremely valuable shellfish and finfish resources, nationally significant endangered species, world-renowned recreational boating, and extensive relatively warm-water beaches. These resources help make the region a recreational playground and seasonal vacation area.

### **South Coastal Region: Natural Characteristics**

The natural resources of the Mount Hope Bay portion of the region include extensive shellfish resources and a dynamic estuary at the mouth of one of the larger rivers wholly within Massachusetts, the Taunton River. This river system sustains one of the largest anadromous fish runs in the Commonwealth that has been used to supplement and help rebuild other fish runs in the state. Recreational fishing is still a favorite activity, although it has declined over the past decade or so from what many believe to be industrial impacts to fish stocks. Buzzards Bay's natural ocean resources include extensive endangered and rare species, including piping plovers, leatherback turtles, and more than one half of the North American population of the endangered roseate tern. Thousands of acres of salt marsh, tidal flats and eel grass beds help form the base of the bay's natural food chain. The bay also has ubiquitous and highly valuable recreational finfish resources including scup, tautog, blue fish, and striped bass. Buzzards Bay is home to some of the richest shellfish resources in the Commonwealth. The resources of both bays are threatened by pollution, primarily nutrients and bacteria from residential development and also from catastrophic events, such as the recent oil spill in Buzzards Bay.

### **South Coastal Region: Industrial Characteristics**

The industrial ports of Fall River and New Bedford are significant economic engines for the region. Both ports receive cargo ships and, increasingly, cruise vessels. Fall River is the second deepest port in the Commonwealth, and is home to significant power generating infrastructure that serves users far beyond the immediate region. The port also has ferry and other boat-building operations, and is currently being considered for the location of major liquefied natural gas (LNG) receiving and handling infrastructure. Buzzards Bay acts as the southern funnel to the Cape Cod Canal, through which pass vast quantities of petroleum and cargo to Boston and other ports farther north. It is estimated that approximately two billion gallons of petroleum products pass through Buzzards Bay each year.

New Bedford's fishing port for three years running has been the most valuable in North America with an extensive fleet that primarily fishes far off shore. The port also is home to a large and vibrant fish processing center that not only processes the local catch, but

also large quantities of fish from other areas brought in by freighter and plane. There are significant large boat repair operations within the harbor. Ferry operations serving Martha's Vineyard have historically used the harbor and may be expanding in the near future.

### **South Coastal Region: Commercial Characteristics**

Small commercial fishing occurs seasonally throughout the region, but to a much greater extent in Buzzards Bay. Targets of these activities include lobster, scup and tautog, fished mostly by small boats either working out of local harbors or being brought in by trailer and launched for the day. Party boat activities for sport fish, such as blues, scup, and striped bass, occur out of New Bedford Harbor. Smaller commercial sport fishing boats are available in many of the other numerous harbors throughout the bay. Although Mount Hope Bay's shellfish resources are not suitable for direct harvesting, there is a significant commercial shellfishery that harvests these resources and then transplants them to other parts of the state to augment the natural populations in those areas. There are extensive commercial shellfish activities in Buzzards Bay. In the late 1980s, it was estimated that Buzzards Bay was responsible for approximately one quarter of the states commercial shellfish harvest.

### **South Coastal Region: Recreational Characteristics**

Both bays are home to significant recreational boating activities that continue to expand. Buzzards Bay in particular is world-renowned for its ideal sailing conditions. In the early 1990s, it was estimated that there were approximately 13,000 recreational boats moored or docked in Buzzards Bay, a relatively high percentage of which were sailboats. This expanding boat activity, while allowing more people to enjoy the region's natural resources, does present management challenges with competing uses, both recreational and commercial. Recreational shellfishing and fin fishing are favorite pastimes of many residents and visitors throughout the favorable seasons. The region's beaches are widespread and heavily used throughout the summer season. Along with the region's many town beaches, there are three state-owned facilities, each with significant beach resources, Horseneck Beach State Park, Demarest Lloyd State Park, and Nasketucket Bay Reservation.

### **South Coastal Region: Military, Cultural, & Other Characteristics**

The United States Coast Guard (USCG) has a station in New Bedford Harbor. Recently the two large cutters stationed at this location for many years have been redeployed to other areas; however, other smaller boats may take their place.

### **Conclusion**

As part of its efforts to prepare these characterizations of the uses of the state's oceans, the UCWG collected anecdotal information from Task Force members and the public regarding perceived ocean and coastal use trends. Many of these observations reflected

concerns over increased usage and competition for ocean and coastal resources. To ascertain and quantify ocean and coastal trends, historical use characterizations provide a record of changes in uses, the decline or disappearance in historical uses, and the increase or emergence of new uses.

Although the OMTF work on use characterization was begun to help members understand the extent and nature of human activities in coastal waters, comprehensive use characterizations are important tools for ocean and coastal managers. An effective use characterization effort may be used in conjunction with natural resource data to illustrate the relationship between human activities and the marine environment, and over time to identify use trends. Complex use characterizations showing historical trends, overlays with natural resource characteristics, and cross-sections of the water column and the air above it are best displayed through a GIS-based dynamic system, similar to that used for MORIS.